General rains of from 1.35 to 2.70 inches over the greater part of the Wateree, Broad, and Saluda watersheds on the 18th and 19th resulted in rises to somewhat above flood stages in the lower Wateree and upper Santee Rivers from the 21st to the 27th, warnings for which were issued during the late afternoon of September 19 by the official at Columbia, S. C. The following stages were attained: At Rimini the water stood above the flood stage from the 21st to 25th, with a crest of 12.9 on September 22 (flood stage, 12 feet).

At Ferguson the river was above flood stage from September 24 to 27, with a crest of 12.6 feet on the 25th (flood stage, 12 feet). The losses were confined to live stock that could not be driven from the swamps, estimated at about $250. Money value of the property saved by the warnings about $12,000.

THUNDERSTORM AT CHARLESTON, S. C., SEPTEMBER 9, 1913.

By J. H. SCOTT, Local Forecaster.

A violent thunderstorm, as sudden as it was severe, struck Charleston about 2.55 p. m., September 9, 1913. The forenoon of that day was almost cloudless and the temperature mounted rapidly to 90° at about 2. p. m., notwithstanding the presence of a strong and extensive area of high pressure pushing southeastward from the Lake region. This "high" undoubtedly contributed to the formation of the storm by overrunning the warm surface layers with colder air, and determined the direction of movement. About 2 p. m. a cumulus cloud was observed forming in the northeast, and at 2.20 p. m., while the cloud was as yet comparatively small, thunder was first heard, after which developments were rapid. The cloud grew apace, and following the Wando and Cooper Rivers, bore down on the city, the thunder becoming almost a continuous roar. The writer has witnessed few clouds of such terrifying aspect. The cloud had a distinct greenish hue; its front was torn by violent winds which lashed to foam the waters of the harbor. It struck the city about 2.55 p. m. and by 3.03 p. m. the wind had attained a velocity of 62 miles per hour from the northeast, maintaining this velocity for the succeeding five minutes. Rain began at 2.56 p.m., and from 3.04 to 3.19 was mixed with hail. From 3.07 to 3.14 p. m. the hailstones were particularly large, many being 1½ inches in their longest diameter. By 3.15 p. m. the wind had diminished to ordinary velocities, but a slow rain continued until 5.30 p. m. Just before and during the storm the temperature fell from 90° to 65°.

The storm presented none of the characteristics of a tornado, though its path of greatest violence was rather limited; but little hail fell at the navy yard, 7 miles north, and on Sullivans Island, 5 miles east, there was neither hail nor violent winds. A few miles southwest of the city the storm was reported as mild in character.

Notwithstanding the suddenness and high velocity of the wind, little damage resulted, although a temporary panic prevailed among the passengers of the ferryboat *Lawrence*, which was blown considerably out of her course. Fishermen caught in the harbor saved themselves by lowering their masts and lying beside them flat in the bottom of their small boats until the storm had passed. Two windows were blown in at the Union Station, and street cars were temporarily tied up on two lines. A box car standing in front of the east entrance to the customhouse had its roof lifted bodily, hurled some 30 feet, and deposited in an inverted position in front of the customhouse.

The maximum wind velocity in this storm has been equaled at this station only once before in September. This occurred September 29, 1896, but in that instance the wind was occasioned by a general storm of the hurricane type.

THE STORM OF SEPTEMBER 3, 1913, IN EASTERN NORTH CAROLINA.

By LEE A. DENSON, Section Director, Raleigh, N. C.

The morning weather map of September 1, 1913, revealed the presence of a disturbance, apparently of very moderate force, central in the Atlantic Ocean about 300 miles southeast of the coast of North Carolina in which the lowest pressure was about 29.9 inches. On the morning of the 2d this storm was evidently approaching the coast, the pressure having fallen to 30.05 inches at Hatteras, with high northeast winds and rain. The center of the disturbance moved inland between Hatteras and Beaufort, N. C., took a westerly course, and passed south of Raleigh about 2 p. m. of the 3d. The barograph trace at this station is of interest in showing the rapidity of the fall and rise of pressure, although the lowest pressure reached was only 29.37 inches at 2.10 p. m. of that date. After leaving the coast section the storm diminished rapidly in intensity and finally spent its force before reaching the mountain region. Over the main portion of the eastern half of the State it was attended by high winds and a rainfall of from 2 to 5 inches, but the rainfall was not heavy after reaching the Cape Fear watershed. Great damage to property and crops resulted over the eastern portion of the State, especially in the Pamlico Sound section, owing to the high waves from the Sound. The highest wind velocity registered was 74 miles from the southeast at Hatteras. At Raleigh the maximum velocity was 37 miles from the northeast, at Wilmington 30 miles from the west, while at Charlotte there was no wind of any consequence.

The greatest loss of property occurred in the vicinity of Washington and Newbern, where the water driven by northeast to southeast gales is reported to have risen 10 feet above previous high-water marks. The bridge of the Norfolk & Southern Railroad at Washington, a mile in length, was washed away, and also a similar bridge at Newbern, and many other small bridges and trestles. The loss by inundation of the lower streets, also to small boats and fishing craft, was very heavy. Telegraph and telephone lines were prostrated or damaged over a wide area. Crops suffered severely, there being considerable damage even as far west as Wake and Durham Counties. At Farmville, N. C., two boys were killed by the collapse of a warehouse, and several people were injured. The total loss of property was probably over $3,000,000.

In the vicinity of Norfolk, Va., the damage by wind was not great. In the open country telegraph and telephone poles and trees were blown down, and at Ocean View, Newport News, and Old Point, Va., a number of small houses were unroofed. There were no marine disasters in Hampton Roads.